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PATENT APPLICATION  
Mo-6837  
LeA 33,565

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICATION OF	)
HANS-DETLEF ARNTZ ET AL	) GROUP NO.: 1711
SERIAL NUMBER: 10/018,177	) EXAMINER: R. A. SERGENT
FILED: DECEMBER 12, 2001	)
TITLE: POLYUREA POLYURETHANES	)
HAVING IMPROVED PHYSICAL	)
PROPERTIES	)

**LETTER**

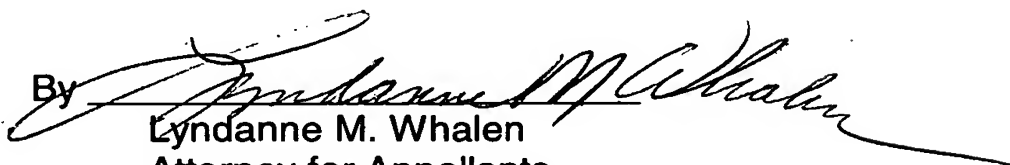
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Enclosed herewith are three copies of an Appeal Brief in the matter of the subject Appeal. Please charge the fee for filing the Brief, \$330.00, to our Deposit Account Number 13-3848.

Respectfully submitted

By

  
Lyndanne M. Whalen  
Attorney for Appellants  
Reg. No. 29,457

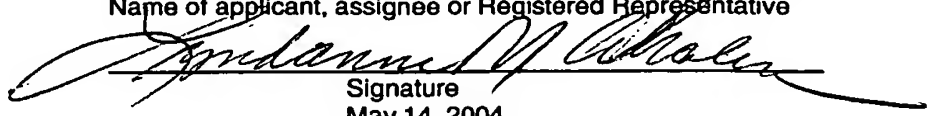
Bayer Polymers LLC  
100 Bayer Road  
Pittsburgh, PA 15205-9741  
Phone: (412) 777-3843  
FACSIMILE PHONE NUMBER:  
(412) 777-3902  
lo/WHALEN/lmw147

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Date

Lyndanne M. Whalen, Reg. No. 29,457

Name of applicant, assignee or Registered Representative

  
Signature

May 14, 2004

Date



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**APPEAL BRIEF**

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sirs:

This Brief, submitted in triplicate, is an Appeal from the Final Action of the Examiner dated December 12, 2003, in which the rejections of Claims 11-22 were maintained.

**I. REAL PARTY IN INTEREST**

Each of the inventors has assigned his interest in this application to Bayer Aktiengesellschaft, a German corporation. The real party in interest in this Appeal is therefore Bayer Aktiengesellschaft.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450 05/14/04

Date

Lyndanne M. Whalen, Reg. No. 29,457

Name of applicant, assignee or Registered Representative

  
Signature

May 14, 2004  
Date

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## II. RELATED APPEALS AND INTERFERENCES

There are no pending appeals or interferences of which Appellants are aware that would be affected by or have a bearing on the Board's decision in this Appeal.

## III. STATUS OF CLAIMS

Claims 11-22 remain pending and are the subject of this Appeal.

Claims 1-10 were cancelled in Appellants' Preliminary Amendment filed simultaneously with the above-identified application.

## IV. STATUS OF AMENDMENTS

No amendments to any of the claims were made or requested subsequent to the Final Action.

## V. SUMMARY OF THE INVENTION

The present invention relates to a process for the production of oil and petroleum-resistant (polyurea)polyurethanes, the products of this process and articles made from the products of this process. In the process of the present invention, (1) a polyether polyol component satisfying specified criteria, (2) a polyester polyol satisfying specified criteria, (3) a polyisocyanate and (4) a chain extending agent are reacted, optionally in the presence of other additives, at an isocyanate index of from 70 to 130.

## VI. ISSUES

- A. Claims 12, 13 and 16 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The specific basis for this rejection is that adequate support has not been provided for the amendment to Claim 12 specifying the sum of the mole percents.
- B. Claims 11, 15, 17-19 and 21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Mao (U.S. Patent 4,124,572).
- C. Claims 14, 20 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Mao (U.S. 4,124,572).

## VII. GROUPING OF CLAIMS

- A. None of Claims 12, 13 or 16 will be argued separately in response to ISSUE A. Claims 12, 13 and 16 therefore stand or fall together with respect to ISSUE A.
- B. Claims 11 and 15 will not be argued separately in response to ISSUE B. Each of Claims 17, 18, 19 and 21 will be argued separately in response to ISSUE B. Claims 17, 18, 19 and 21 do not therefore stand or fall together with Claims 11 and 15.
- C. Each of Claims 14, 20 and 22 will be argued separately in response to ISSUE C. Claims 14, 20 and 22 do not therefore stand or fall together.

## VIII. ARGUMENTS

- A. Appellants' specification does provide support for the claim limitation regarding the sum of the molar percentages specified in Claim 12.

The mole percents in Claim 12 specify the percentage of each of the listed acids and diols present in the polyester polyol component. One skilled in the art can readily determine from the teaching at page 5, line 25 through page 6, line 2 of the specification that the sum of the amounts of the individual polyester polyols present in each of the three specified polyester polyol components is clearly 100 mole percent.

The amendment of Claim 12 to require that the sum of the amounts of the individual polyester polyols present in the polyester polyol component is therefore described in the specification. Appellants' Claims 12, 13 and 16 do therefore satisfy the written description requirement of 35 U.S.C. § 112, first paragraph.

- B. Appellants' invention as claimed in Claims 11, 15, 17-19 and 21 is not anticipated by the teachings of Mao.

Mao discloses thermoplastic polyurethane elastomers produced from a reaction mixture which includes a poly(oxypropylene)-poly(oxyethylene) glycol (molecular weight from 1000 to 3000) containing 25-60% by weight of oxyethylene groups, a polyester polyol (molecular weight from 1000 to 3000), a polyisocyanate

and a chain extender. These thermoplastic elastomers are characterized as having excellent high tensile strength, high tear resistance, high elongation, excellent thermal properties, outstanding processability, good mold-ability and paintability.

Mao **does not** teach anything with respect to oil and petroleum resistance. Appellants' claimed invention is directed to a process for the production of oil and petroleum-resistant (polyurea)polyurethanes, the oil and petroleum-resistant products of this process and oil and petroleum-resistant articles made with these products.

Mao **does not** teach that use of the specific types of polyester polyols required in Appellants' claims in the amounts required by Appellants' claims would be advantageous for any reason. In fact, Mao teaches only that any of the known polyester polyols may be used in the reference compositions and does not recommend any particular amount of polyester polyol.

Specific reference was made to Examples A-D in Table I of the Mao reference in the Office Action dated December 18, 2002 as support for this rejection of Appellants' claims.

Appellants would note that in each of the reference Examples A-D, the ratio of equivalents of isocyanate to equivalents of hydroxyl groups was either 6.0 (Examples A, C and D) or 4.5 (Example B). Appellants' claimed process requires an isocyanate index of from 70 to 130 (i.e., an isocyanate to hydroxyl equivalent ratio of 0.7 to 1.3) which is clearly not taught or suggested by Examples A-D of Mao. Examples A-D of the Mao reference do not therefore support the rejection of Appellants' claimed invention.

At page 3, lines 15-16 of the Office Action dated June 4, 2003, the Examiner argued that Mao discloses an index ratio that meets Appellants' claimed ratio. Specific reference was made by the Examiner to column 3, lines 53-58 and column 4, lines 54-55 of the Mao reference.

At column 3, lines 53-58 of the reference, it is stated that:

The NCO/OH ratio used to prepare the flexible thermoplastics may range from 0.95 to 1.10 with 1.00 to 1.05 being preferred.

Appellants submit that this teaching does **not** include the NCO/OH ratios of 0.7 to 0.94 and 1.06 to 1.30 within the scope of the claimed invention. Nor does Mao teach or suggest that the broad range of NCO/OH ratios of Appellants' invention would be suitable for producing the reference elastomers.

At column 4, lines 54-55 of the Mao reference, it is stated:

The ratio of equivalents of polyol mixture/chain extender/diisocyanate in the final polymer is 1/5/6.

Such relatively large quantity of chain extender required by Mao (i.e., 5 times the number of equivalents of the polyol mixture) is not required in Appellants' claimed invention. In fact, Mao's use of such large quantities of chain extender support Appellants' position that Mao is directed to completely different types of materials than the gas and petroleum resistant elastomers being claimed by Appellants.

The teachings of the Mao reference are further distinguishable from the present invention with respect to the polyester polyols suitable for use in the respective processes. More specifically, Mao teaches that any of the known polyester polyols may be used in substantially larger quantities than the 3 to 30 wt% of the polyester polyol required in Appellants' invention. The reference does not teach or suggest that there would be any advantage to using the polyester polyols required in Appellants' claimed invention in the relatively small amounts (i.e., 3-30 wt%) required in Appellants' claims.

One skilled in the art reading the Mao reference would therefore need to pick and choose from the teachings of that reference without any guidance from the teachings of that reference in order to "arrive at" Appellants' claimed invention. Mao does not therefore disclose a process for producing the oil and petroleum resistant compositions of the present invention in the manner necessary to support a proper rejection under 35 U.S.C. § 102(b).

Mao does not teach anything with respect to oil and petroleum resistance. Nor does Mao contain any indication that any of the thermoplastic polyurethanes disclosed therein are oil or petroleum resistant.

Mao does not disclose the oil and petroleum-resistant polyurea)polyurethanes of Appellants' Claim 17 in the manner necessary to support a rejection of Claim 17 under 35 U.S.C. § 102(b).

Mao does not teach or suggest that any of the disclosed thermoplastic polyurethanes disclosed therein are transparent and oil and petroleum-resistant.

Mao does not therefore disclose the transparent, oil and petroleum-resistant (polyurea)polyurethanes of Appellants' Claim 18 in the manner necessary to support a proper rejection under 35 U.S.C. § 102(b).

Mao does not teach or suggest that any of the disclosed thermoplastic polyurethanes are resistant to hydrolysis and microbial action and are oil and petroleum-resistant.

Mao does not therefore disclose the (polyurea)polyurethanes which are resistant to hydrolysis and microbial action and are oil and petroleum-resistant claimed in Appellants' Claim 19 in the manner necessary to support a proper rejection under 35 U.S.C. § 102(b).

Mao does not teach or suggest safety clothing which is oil and petroleum-resistant.

Mao does not therefore disclose Appellants' oil and petroleum-resistant safety clothing claimed in Claim 21 in the manner necessary to support a proper rejection under 35 U.S.C. § 102(b).

C. Mao does not teach or suggest Appellants' invention as claimed in Claims 14, 20 and 22.

Mao does not teach or suggest a process in which the polyester polyol component is included in the polyisocyanate component rather than the poly(oxypropylene)-poly(oxyethylene) glycol component.

A rejection under 35 U.S.C. § 103 must have a factual basis.

Mao does not provide the necessary factual basis to support the rejection of Appellants' process as claimed in Claim 14 in which the polyester polyol must be included in the polyisocyanate component.

The teachings of Mao can not therefore be construed in any manner which would render Appellants' process as claimed in Claim 14 obvious.

Mao does not teach or suggest that any shoe sole produced in accordance with the disclosed process will be oil and petroleum-resistant.

Mao does not therefore provide the factual basis necessary to support the 35 U.S.C. § 103 rejection of Appellants' oil and petroleum-resistant shoe soles claimed in Claim 20.

Mao does not teach or suggest anything with respect flexible tubing much less flexible tubing that is oil and petroleum-resistant.

Mao does not therefore provide the factual basis necessary to support the rejection under 35 U.S.C. § 103 of Appellants' oil and petroleum-resistant flexible tubing claimed in Claim 22.

#### IX. CONCLUSION

The amounts of the individual polyester polyols used in each of the specific polyester polyol compositions disclosed in the specification total 100 mol%. The specification does therefore describe the subject matter of Claims 12, 13 and 16 in a manner to satisfy the requirements of 35 U.S.C. § 112, first paragraph.

Mao does not teach those skilled in the art how to make oil and petroleum-resistant polyurethanes. Mao does not therefore disclose Appellants' invention as claimed in Claims 11, 15, 17-19 and 21 to those skilled in the art in the manner required by 35 U.S.C. § 102(b).

Mao does not even mention oil and petroleum-resistant polyurethanes (Claim 17) which are transparent (Claim 18) or resistant to hydrolysis and microbial action (Claim 19). Nor does Mao mention oil and petroleum-resistant safety clothing (Claim 21). The teachings of Mao can not therefore be construed in any manner which would anticipate or render obvious Appellants' invention as claimed in Claims 17, 18, 19 or 21.

There is no factual basis in the Mao disclosure to support the rejection of Appellants' claim 14 directed to a process in which the polyester polyol is combined with the polyisocyanate component rather than the other hydroxyl group-containing materials under 35 U.S.C. § 103 (a).

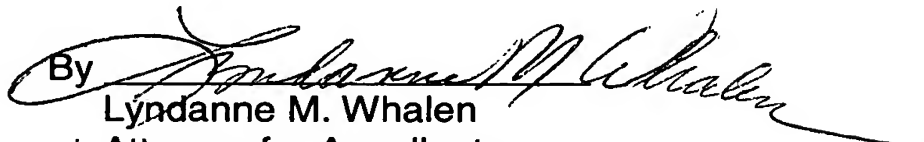
There is no factual basis in the Mao disclosure to support the rejection of Appellants' claims directed to oil and petroleum-resistant shoe soles (Claim 20) or flexible tubing (Claim 22) under 35 U.S.C. § 103(a).



Appellants therefore maintain that each of the Examiner's rejections is in error and respectfully request that each of these rejections be reversed and that Claims 11-22 be allowed.

Respectfully submitted,

Bayer Polymers LLC  
100 Bayer Road  
Pittsburgh, Pennsylvania 15205-9741  
(412) 777-3843  
FACSIMILE PHONE NUMBER:  
(412) 777-3902  
lo/WHALEN/lmw146

By   
Lyndanne M. Whalen  
Attorney for Appellants  
Reg. No. 29,457

## APPENDIX-CLAIMS ON APPEAL

Claim 11. A process for the production of a (polyurea)polyurethane which is oil and petroleum resistant as determined in accordance with DIN EN 344 comprising reacting a mixture comprising

- A1) a polyether polyol component having a number average molecular weight of from 1000 to 8000 g/mol and a hydroxyl functionality of 2.0 or is substantially a mixture with an average hydroxyl functionality of 2.02 to 2.95 comprising
  - a) at least one polyether diol with a hydroxyl value in the range of 10 to 115 prepared by propoxylation of a difunctional starter compound and subsequent ethoxylation at a ratio by weight of propylene oxide to ethylene oxide of 60:40 to 85:15 and
  - b) at least one polyether triol with a hydroxyl value in the range of 12 to 56 prepared by propoxylation of a trifunctional starter compound and subsequent ethoxylation at a ratio by weight of propylene oxide to ethylene oxide of 60:40 to 85:15,
- A2) from 3 to 30 wt.%, based on total weight of components A1) and A2), of a polyester polyol component having a number average molecular weight of from 1000 to 6000 g/mol prepared by polycondensation of a) an organic polycarboxylic acid and/or a derivative thereof and b) a polyhydric alcohol,
- B) a polyisocyanate component,
- C) a chain extending agent,

and optionally,

- D) a blowing agent and/or
- E) an additive

at an isocyanate index of from 70 to 130.

Claim 12 . The process of Claim 11 in which the polyester polyol component comprises

- (1) from 20 to 50 mol%, based on mols of polyester polyol, of units derived from adipic acid,
- (2) from 0-20 mol%, based on mols of polyester polyol, of units derived from glutaric acid,
- (3) from 0 to 10 mol%, based on mols of polyester polyol, of units derived from succinic acid,
- (4) from 10 to 30 mol%, based on mols of polyester polyol, of units derived neopentyl glycol,
- (5) from 10-40 mol%, based on mols of polyester polyol, of units derived from hexanediol,
- (6) from 0-15 mol%, based on mols of polyester polyol, of units derived from ethanediol, and
- (7) from 10-20 mol%, based on mols of polyester polyol, of units derived from butanediol,

with the sum of (1) through (7) totalling 100 mol%.

Claim 13 . The process of Claim 12 in which the polyester polyol component is included in the polyisocyanate component.

Claim 14. The process of Claim 11 in which the polyester polyol component is included in the polyisocyanate component.

Claim 15. The process of Claim 11 in which the polyether polyol component, polyester polyol component, chain extending agent, any blowing agent and any additive are combined before being reacted with the polyisocyanate component.

Claim 16. The oil and petroleum-resistant (polyurea)polyurethane produced by the process of Claim 12.

Claim 17. The oil and petroleum-resistant (polyurea)polyurethane produced by the process of Claim 11.

Claim 18. The (polyurea)polyurethane of Claim 17 which is transparent.

Claim 19. The (polyurea)polyurethane of Claim 17 which is resistant to hydrolysis and microbial action.

Claim 20. A shoe sole composed of the (polyurea)polyurethane of Claim 17.

Claim 21. Safety clothing produced from the (polyurea)polyurethane of Claim 17.

Claim 22. Flexible tubing produced from the (polyurea)polyurethane of Claim 17.